

## Laser Beams In At Just £70



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The Laser has a Spectrum-style rubber keyboard. Basic keywords can be typed out in full or entered with a single keypress.

Max Phillips lights on the cheapest colour micro on sale in the UK

The Laser 200 is a bit like an old friend. If it looks familiar, it's because it is more or less the same machine as the Textet TX8000, Pro-Tested way back in PCN issue 1.

Despite all its promises and its imminent launch, the Textet disappeared almost as quietly as it arrived. Now the Hong Kong produced machine is back. One hopes that take two will see it in the shops.

We left the story where the Textet was the cheapest colour computer not quite on the UK market. Since then Sinclair, with its usual impeccable timing, has reduced the price of the Spectrum to £99.95. The Laser still offers an alternative because it has a seductive £70 price tag, though only half its original 8K of memory.

### Presentation

Nothing special here though the Laser does seem very complete for £70. You get a machine, power supply, cassette and TV lead, three manuals and a demo tape.

### Documentation



A slight departure from the norm, the Laser comes with three manuals - a user's manual, a Basic reference manual and a booklet called 'Basic Applications Programs'. The user's manual is a six-page rag for setting the machine up. Newcomers will have to be confident and prepared to 'have a go' with this one. It's a reasonable suggestion to separate it from the Basic manual but the thing is so trivial you're likely to lose it.

The Basic reference manual is another example of the obscure art of Basic tutorial/reference writing. It's not as good as many - piling up endless vocab and not explaining what's going on. It's also deadly dull, especially compared to Steven Vickers' 'masterpiece' for the ZX81 and Spectrum.

But its biggest failing is that it's dreadfully short of technical stuff: memory maps, machine code information, pinouts and so on. And what little there is has errors in it. It may be a beginner's machine but you don't want to stay that way. After all, it's the professionals, in software and hardware, who carry a machine by producing the add-ons that make it a good beginner's buy.

The last 24-page booklet is a library of type-it-yourself programs like the ones you get with programmable calculators. It's great to see this idea come back though it's a shame the programs are all so deadly dull. All ridiculously short and mostly maths routines.

## Construction



The Laser's white wedge shaped case is surprisingly well-built for the money. People will be impressed by this, especially if they compare it to something like a 48K Spectrum. There's even a screw-on cover for the expansion connectors at the back of the machine.

Inside is less pretty. It's based on a Z80 at 3.58MHz with 4K RAM and a lot of glue. It isn't badly made or hastily kludged, but even a total layman will detect it is slightly messy. Anyway, it works well so who cares what's inside?

## Keyboard

The Laser has a 45-key keyboard of the rubber pad variety and a good one of its kind. It's helped by the angle and spacing

If you were a typist, you could moan about the lack of a second shift key, no space bar and an awful lot of stretched Control codes for editing. But, the machine is intended for small and inexperienced hands. The Sinclair ZX-Spectrum has proved the point in no mean way.

The cluttered look is caused by optional Basic keywords above and below each key. You can either type out common Basic commands yourself or get them typed for you, using CTRL and another key (for a top keyword) or CTRL and RETURN followed by CTRL and another key for the bottom set of keywords

So you've got the option of working either way. Most people will start by typing words and then gradually adopt the keywords as they learn where they are.

The keywords are implemented at a late stage. They just trot out the relevant characters into the keyboard buffer. They are not single tokens/characters like the Sinclair system. Side-effects include pressing one key to type a word and then having to press RUBOUT several times to erase it. You can even enter keywords in response to an INPUT statement!

INKEY\$ lets you test for a key being held down. Different codes are returned for the CTRL and CTRL and RETURN combinations. So you could program your own programmable keys.

## Screen



The Laser plugs into a standard TV and also boasts a Composite video socket for a monitor. It's good picture despite the price. The colours, though not unreasonable, are of the rancid Apple/Dragon variety rather than the bold, bright colours possible with machines like the BBC.

The only problem seems to be a good dose of 'snow' during fast access to the graphics screen. The problem occurs on many machines from machine code programs that don't time screen access carefully. No doubt professional software houses will find a way round it, but it shouldn't happen to the beginner writing in Basic.

Using the Laser has a sense of déjà-vu. The display is very similar to the 6847 powered screens of the Dragon and Tandy Colour Computer though the Laser has it reduced to the bare bones.

There are two formats. MODE(0) is a text screen and MODE(1) a 'high resolution' screen. MODE(0) provides 32 x 16 upper case only text on a green or muddy orange background. The only possible text attribute is inversed text - it can't be coloured or flashing.

The text screen supports 2 x 2 pixel characters in eight colours - nine if you count the black that annoyingly appears behind 'unlit' pixels. These can be simply typed in, but beyond that aren't easy to use.

There isn't a SET and RESET to control them so you must resort to POKE (which lets you get at all eight colours directly) or to PRINT@ CHR\$ (which lets you at only the graphics in the colour set by the last COLOR statement). The codes and addresses used for these two are, of course, very different. Still, it provides something to get your teeth into.

MODE(1) is the rather hopefully titled 'High resolution' mode. 128 x 64? Well - it's higher resolution than the text screen but it is ridiculously out of date compared to everything from a Spectrum upwards. And it's only got four colours.

You can have one of two choices. A green background with green, yellow, blue or red; or a 'buff' background with buff, cyan, magenta or orange. Basic provides just SET and RESET to control the screen. The lack of serious graphics support (lines, circles and so on) won't do the beginner any favours

The advantage of this system is that it uses a mere 2K of memory. So you can run high resolution programs on a standard machine provided they occupy a bit less than 2K. Like the Dragon, you can't write text on the graphics screen, unless you produce suitable machine code routines to do it for you. This will probably prove a bit hard on the unexpanded machine but there's hope that a 16K Laser will offer new possibilities for the experienced and ambitious.

## Storage



**Besides TV and monitor outputs, the Laser has two edge connectors for 16K or 64K RAMpacks and peripherals.**

Your usual cassette recorder is used for storage. A 600-baud system provided no serious problems. Strangely, the Laser has a stereo jack at the computer end of its lead and the more normal MIC and EAR jacks at the other. The lack of motor control using a connection to the tape recorder's REM socket is a disappointment. A lot of loading goes on in a 4K machine.

Cassette handling is well catered for with CLOAD, VERIFY, CSAVE and CRUN for programs and PRINT# and INPUT# for data files. Files are named and suitable on-screen prompts take the guesswork out of cassette use.

Laser has mentioned the inevitable disk though it does seem to be a fairly distant option. Even so, the Basic apparently has a route to allow for a disk to be added.

## Expansion

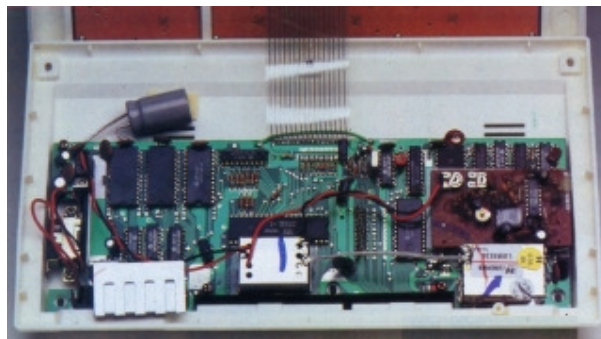
Expansion is through two sockets, one labelled 'peripheral' and the other 'memory'. Minor things such as printer interfaces are optional extras that will push the price up.

The most important add-on is the 16K RAMpack. This is already available, is beautifully made and worked with no problem whatsoever. It's a crucial part of the Laser's success. If people but it as standard then Laser programs will be much better and beginners will do better than the raw 4K deal they get for £70. Unfortunately, a Laser plus a RAMpack is ever so nearly a 16K Sinclair Spectrum.

So there's a chance that most users will stick with a 4K machine. Certainly the Vic 20 priced itself into this position, though it has the advantage of plug-in cartirdges that come with extra memory. But the Vic is a lot older than the Laser and newcomers are going to find 4K a rapid disappointment.

Other add-ons promised by Laser include a Centronics interface, joysticks, light pens, even one of those Tandy, Sharp, Oric printer/plotters. A 64K RAMpack is promised, but is probably a bit over the top for this type of machine. The other curious promises are Laser Forth and Laser Basic on cassette. What's wrong with the Basic it's got?

## Basic



**The inside of the Laser is quite messy compared to its external styling and construction. The system is based on a Z80 with 4K RAM.**

This is a standard 8K Microsoft Basic providing a familiar and stable environment for nearly every programmer in the business. It is neatly implemented, it's only serious drawback being the limited graphics support.

A full screen editor makes editing a treat. The nearest thing to this is probably the Pet-Vic editor. It allows you to move on any line on the screen, insert and delete

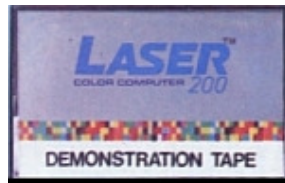
characters and so on. It's a shame there is an 80-character limit on input lines and a clear-to-end-of-line would have been useful. There are 20 error messages although the two letter codes from the Texet are still in the ROM.

The only surprising extra is PRINT USING, a bit out of place in a home machine with a 32-column screen, but useful nonetheless. IF... THEN... ELSE is provided along with a COPY command to dump the screen to either a Seikosha GP100 or 100A printer. How ironic that these are typically configured as RS232 devices and Laser is planning a Centronics interface!

Sound is provided through a built-in speaker and is a bit like a dying Stylophone. Basic has just SOUND *pitch,duration* to play notes. So it is easy to type in the odd melody but will be harder to provide a game soundtrack.

Basic runs merrily at a reasonable pace and Laser should be congratulated for choosing the Microsoft route. It may not be the best Basic in the world but it's a great one to learn with. You can go from the Laser to Apples, Pets, IBMs etc with the minimum of trouble. The only obvious bug is that a numeric INPUT can be answered with a null return and consequent errors.

## Software



As usual with any new machine, it's the way the software crumbles that counts. Laser's UK distributor, Leisure-Zone, has teamed up with software house Abbex to produce an introductory cassette and a large range of Lasersoft titles.

The advantage of this is that the Laser has a software base and it therefore stands a chance. But there is a danger that Abbex's strong lead will be a deterrent to others. Even so, there are plenty of Z80 people knocking around to take up the challenge of a simple 4K machine.

## Verdict

The Laser 200 is a colour ZX81. It will appeal to genuine penny scrapers or those who don't want to gamble too heavily on trying a new hobby. There will also be buyers who simply worry about Sinclair's bottom-line engineering.

It provides a reasonable introduction to computing though the manual doesn't make things easy.

But the long-term success of the machine does depend heavily on how the software houses and hardware sheds take to it. The Laser won't compete with the Spectrum at all until it has a tiny fraction of the Spectrum's vast low-cost quality software base.

And of course, the Spectrum has the added attraction of networking and Microdrives to keep it ahead for years to come.

But, provided it gets into the shops (crossed fingers this time!), the Laser is a possibility.

### **Specifications**

Price:	£69.96 inc VAT
Processor:	Z80 3.58MHz
RAM Memory:	4-16K
ROM Memory:	16K
Text format:	32 x 16, nine colours
Graphics Screen:	128 x 64, 4 colours
Keyboard:	45 keys, single keyword entry
Storage:	Cassette, 600 baud
OS/Language:	Microsoft Basic
Distributor:	Leisure Zone Ltd, distribution is through Computers For All (0268 418414)
Software included:	Demo tape

### **Prices**

Laser 200 4K	£69.95	Now
16K RAM pack	£29.95	Now
64K RAM pack	£59.95	Nov
2 Joysticks	£19.95	Aug
Centronics interface	£19.95	Aug
Light pen	£19.95	?
4-colour plotter/printer	£149.95	Sept
Laser Basic	£5.95	Aug

Laser Forth	£5.95	Aug
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### **Shortlist**

ZX81 + 16K RAM Pack	£45.00
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Laser 200 4K	£69.95
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Sinclair ZX Spectrum 16K	£99.95
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Oric 1 16K	£99.95
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